REMARKS

In response to the Official Action mailed on July 6, 2005, the application has been amended. No new matter has been added. Reconsideration of the rejections of the claims is respectfully requested in view of the above amendments and the following remarks.

The specification has been amended to delete several extraneous words on page 7 and to add the expression "hot dipping" on pages 9 and 10 to parenthetically refer to what is described in the specification as the "molten solder method", since "hot dipping" is the more commonly used name for this process in the United States.

On page 3 of the Official Action, claims 1 - 6, 11, and 12 were rejected under 35 USC 103(a) as unpatentable over Ito et al (U.S. Patent No. 6,867,982, referred to below as Ito) in view of Choon et al (U.S. Patent No. 5,608,188, referred to below as Choon). This rejection is respectfully traversed.

A first error in the rejection is that the cited references do not teach all the features of the rejected claims. Claim 1 describes a cap-shaped lid including a lip extending outwards from an outer surface of a wall structure by 10 - 500 μm. The cited references do not disclose or suggest such an arrangement.

Ito discloses a high-frequency component including a ceramic substrate 1 and a metal cover 2 attached to an electrode pad 5 on the substrate 1 by solder. As acknowledged by the Official Action, Ito does not disclose a lip extending outwards from an

outer surface of a wall structure by 10 - 500 μm as set forth in claim 1.

Choon discloses a multi-component electromagnetic shield formed by stamping and forming of sheet metal. It includes a box-like enclosure 101 having curved mounting edges 503 formed on the lower ends of its walls. The Official Action relies on column 3, lines 59 - 61 of Choon as supposedly teaching a lip extending from the outer surface of the walls of the enclosure 101 by 10 - 500 μm, and the Official Action proposes to modify the invention of Ito to make the flange of the cover 1 of Ito extend from the wall of the cover 1 by 10 - 500 μm.

The Applicants respectfully submit that the Examiner has misread the Choon reference. Choon does not in fact teach a lip extending from a wall structure by 10 - 500 μm. Column 3, lines 57 - 61 of Choon, which include the passage relied upon in the Official Action, read as follows:

> Referring to FIG. 4 among others, the plurality of mounting edges (503) including a first mounting edge (411) is depicted. The mounting edges are fabricated during the forming operation for the enclosure by forming a 0.2 mm typical radius across the mounting edge.

In accordance with mechanical engineering practice, the language "forming a 0.2 mm typical radius" in Choon refers solely to the radius of curvature of the mounting edges 503. If desired by the Examiner, the Applicants would be happy to obtain a declaration from a draftsman as evidence that "radius" here means "radius of curvature". There is no disclosure in Choon of how far the mounting edges 503 extend from the outer walls of the enclosure 101; only the radius of curvature is disclosed. As

such, Choon contains no teaching of a lip extending outwards from an outer surface of a wall structure by 10 - 500 μm as set forth in claim 1 or by any specific distance. Therefore, the cited references do not include all the elements of claim 1, so they cannot be combined so as to result in an arrangement having all the features of claim 1 and cannot render this claim obvious.

A second error in the rejection is that a person skilled in the art would receive no motivation from the cited references to combine them in the manner proposed by the Official Action. Even if it were assumed that Choon actually taught that its mounting edges 503 extended from the walls of the enclosure 101 by a distance in the range of 10 - 500 μm, a person skilled in the art would find no motivation from Choon to modify the structure disclosed in Ito so as to form the flanges of the cover 1 of Ito into a curved shape like that employed for the mounting edges 503 in Choon. Choon teaches the formation of rounded mounting edges 503 on isolated, intermittent regions spaced around the periphery of a metal enclosure 101. The flange of the cover 1 of Ito, however, extends around the entire periphery of the cover 1. Choon does not teach how or even suggest the possibility of forming a curved mounting edge 503 around the entire periphery of a cover like the cover 1 of Ito. Given the quite different structure of the mounting edges 503 of Choon and the peripheral flange of the cover 1 of Ito, a person skilled in the art would see no applicability of the mounting edge structure used in Choon to the cover of Ito.

Accordingly, since neither of the cited references teaches a

lip extending outwards from an outer surface of a wall structure by 10 - 500 μm, it is impossible for the references to be combined so as to result in an arrangement having all the features recited in the rejected claims. Furthermore, since the references provide no motivation to combine them in the manner proposed by the Official Action, the proposed combination of references is unreasonable, and the rejection fails to set forth a *prima facie* case of obviousness. Claim 1 and claims 2 - 6, 11, and 12 which depend from claim 1 are therefore allowable.

Claim 5 further patentably distinguishes the present invention from the cited references. Claim 5 states that solder is provided on the entire inner surface of the lid of claim 1. The Official Action states that column 4, lines 22 - 23 and 33 - 36 of Ito state that the metal cover 2 of Ito has solder on its entire surface, but Ito does not in fact contain such a statement. Ito merely states that an inner surface of the metal cover 2 is solder plated and that the outer surface B thereof is nickel plated. There is no description of the extent of the solder plating, and thus there is no basis for concluding that the cover 2 has solder on its entire surface. In Choon, the electromagnetic shield 100 appears to be connected to a carrier 201 by reflow of a solder paste, and there is no description of the shield having solder provided anywhere thereon. Thus, neither reference discloses or suggests a lid having solder provided on an entire surface thereof as set forth in claim 5, so the references cannot render claim 5 obvious.

Amended claim 6 further patentably distinguishes the present invention from the cited references Amended claim 6 describes a packaged electronic part having a lid which hermetically seals an electronic device inside the package. Amended claim 6 is supported by page 3, lines 22 - 24, which states that the lip of the lid enables the lid to be soldered to the base to reliably form an airtight seal. Neither of the cited references discloses or suggests a lid which seals an electronic device inside a package. In Ito, the metal cover 2 includes a hole 4, so the interior of the cover 2 is open to the atmosphere, and the cover 2 clearly does not hermetically seal anything inside a package. Similarly, the electromagnetic shield 100 disclosed in Choon has a number of openings at its corners, at its lower edges, and at the locating slots 407, 409 for receiving tabs of a partition 103. As a result, the interior of the shield 100 is open to the atmosphere, and there is no formation of a hermetic seal as set forth in claim 6. Even without the various openings, there is no disclosure that the manner in which the metal cover 2 of Ito is attached to a substrate 1 or the manner in which the shield 100 of Choon is joined to a carrier 201 is capable of forming an airtight join necessary to form a hermetic seal. In fact, as set forth below with respect to claim 12, the electroplated solder layer formed on the inner surface of the cover 2 of Ito is incapable of forming a hermetic seal. All that is required in Ito and Choon is a mechanical connection between the metal cover 2 of Ito or the shield 100 of Choon and the base on which the cover 2 or shield 100 is mounted.

Thus, since neither reference discloses or suggests a lid which hermetically seals an electronic device inside a package, they cannot render claim 6 obvious.

Amended claim 12 further patentably distinguishes the present invention from the cited references. Amended claim 12 states that the solder layer set forth in claim 5 is formed by hot dipping. Amended claim 12 is supported by page 9, lines 4 - 6 of the application as filed, which describe a layer of solder being applied to a metal strip by the so-called "molten solder method", which the Examiner will recognize from the description on page 9 as being what is more commonly referred to as "hot dipping". Neither of the references discloses or suggests a lid having a hot dipped solder layer.

As stated above, in Choon, the shield 100 appears to be attached to a carrier 201 by solder paste. In Ito, column 4, lines 22 - 24 state that the inner surface of the metal cover 2 is preferably solder-plated. Ito does not specify how the solder plating is formed, but from context, it is clear that it is formed by electroplating. This is because in the same sentence, Ito states that the outer surface of the cover 2 is nickel-plated, and nickel plating of electronic parts is invariably carried out by electroplating, due to the very high melting of Ni. Therefore, when Ito refers to plating, it means electroplating. As such, neither reference discloses a layer of solder formed by hot dipping, as in amended claim 12.

The limitation in claim 12 that the solder layer is formed

by hot dipping is not a mere process limitation but is a physical limitation of the resulting lid, since a hot dipped layer is physically distinguishable from an electroplated solder layer. A principal difference between the two is their thicknesses. An electroplated solder layer is extremely thin, and is typically on the order of 1 - 3 μm thick. Before of this very low thickness, an electroplated solder layer is incapable of forming a hermetic seal between a cover and a base, since the electroplated layer does not provide enough solder for the purpose.

In contrast, a hot dipped solder layer is much thicker. The minimum thickness that can be achieved by hot dipping of solder is around 10 μm, and much larger thicknesses can be achieved. For example, page 10, line 3 of the present application describes an example of a lid having a hot dipped solder layer with a thickness of 20 μm.

On account of the considerable thickness of a hot dipped solder layer, when such a layer is formed on the inner surface of a lid, it provides enough solder to be able to form a hermetic seal between a lid and a base, particularly when the solder layer extends along the inner surface of the side walls of the lid. As described on page 8, lines 24 - 27 of the specification of the present application, when a lid with a hot dipped solder layer is heated in a reflow furnace, the solder on the inner surface of the lid melts. The molten solder on the inner surface of the side walls of the lid is drawn downwards by the molten solder present between the lip of the lid and the base to which the lid is being attached. As a result, a large amount of solder

accumulates at the bottom of the wall structure and forms a solder joint in the vicinity of the lip. As shown in Figure 4, the molten solder which accumulates in this manner forms a fillet on the inner side of the lip, and the fillet provides a large area of contact between the solder and the base on which the lid is mounted. On account of the large amount of solder which accumulates, the joint between the lid and the base forms a hermetic seal. This effect cannot be achieved with an electroplated solder layer such as is used in Ito for lack of enough solder. Neither of the references shows any realization of the possibility of forming a hermetic seal even when the region of contact between the lip of a lid and a base is extremely small by employing a hot dipper solder layer on the inner surface of the lid.

Yet another physical difference between the structure of a hot dipped solder layer and an electroplated layer is that hot dipping results in the formation of intermetallic compounds which produce a strong bond between the solder layer and the base metal of the lid, whereas electroplating does not form such intermetallic compounds.

Thus, since neither of the cited references suggests a hot dipped solder layer as set forth in claim 12, they cannot render this claim obvious.

New claims 13 - 16 describe additional features of the present invention. These claims are allowable as ultimately depending from claim 1.

In light of the foregoing remarks, it is believed that the present application is in condition for allowance. Favorable consideration is respectfully requested.

Respectfully submitted,

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